

Docket No. 256141US90PCT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF: Noriyuki TAOKA, et al.

SERIAL NO: 10/506,438

GAU:

FILED: September 2, 2004

EXAMINER:

FOR: HONEYCOMB FILTER FOR PURIFYING EXHAUST GASES, AND EXHAUST GAS PURIFYING DEVICE

INFORMATION DISCLOSURE STATEMENT UNDER 37 CFR 1.97

COMMISSIONER FOR PATENTS
ALEXANDRIA, VIRGINIA 22313

SIR:

Applicant(s) wish to disclose the following information.

REFERENCES

- ☒ The applicant(s) wish to make of record the references cited in the International Search Report and listed on the attached form PTO-1449. Copies of the listed references are attached, where required, as are either statements of relevancy or any readily available English translations of pertinent portions of any non-English language references.
- ☐ A check or credit card payment form is attached in the amount required under 37 CFR §1.17(p).

RELATED CASES

- ☐ Attached is a list of applicant's pending application(s), published application(s) or issued patent(s) which may be related to the present application. In accordance with the waiver of 37 CFR 1.98 dated September 21, 2004, copies of the cited pending applications are not provided. Cited published and/or issued patents, if any, are listed on the attached PTO form 1449.
- ☐ A check or credit card payment form is attached in the amount required under 37 CFR §1.17(p).

CERTIFICATION

- ☐ Each item of information contained in this information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this statement.
- ☐ No item of information contained in this information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application or, to the knowledge of the undersigned, having made reasonable inquiry, was known to any individual designated in 37 CFR §1.56(c) more than three months prior to the filing of this statement.

DEPOSIT ACCOUNT

- ☒ Please charge any additional fees for the papers being filed herewith and for which no check or credit card payment is enclosed herewith, or credit any overpayment to deposit account number 15-0030. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

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Form PTO 1449
(Modified)U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICEATTY DOCKET NO.
256141US90PCTSERIAL NO.
10/506,438

LIST OF REFERENCES CITED BY APPLICANT

APPLICANT
Noriyuki TAOKA, et al.FILING DATE
September 2, 2004

GROUP

U.S. PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUB CLASS	FILING DATE IF APPROPRIATE
	AA						
	AB						
	AC						
	AD						
	AE						
	AF						
	AG						
	AH						
	AI						
	AJ						
	AK						
	AL						
	AM						
	AN						

FOREIGN PATENT DOCUMENTS

		DOCUMENT NUMBER	DATE	COUNTRY	TRANSLATION	
					YES	NO
	AO	8-28248	01/30/96	JP (with English abstract)		NO
	AP	5-302507	11/16/93	JP (with English abstract)		NO
	AQ	2001-286725	10/16/01	JP (English abstract only)		NO
	AR	2-146212	06/05/90	JP (with English abstract)		NO
	AS	6-193431	07/12/94	JP (with English abstract)		NO
	AT	0 990 777	04/05/00	EP		NO
	AU					
	AV					

OTHER REFERENCES (Including Author, Title, Date, Pertinent Pages, etc.)

	AW	
	AX	
	AY	
	AZ	<input type="checkbox"/> Additional References sheet(s) attached

Examiner

Date Considered

*Examiner: Initial if reference is considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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STATEMENT OF RELEVANCY

JP 8-28248

Figs. 4-6 are views that shows the filter unit 7 which constitutes a filter 3.

These views show that square-like through holes on cross-section 7a is regularly formed along the axis line in the square pillar-like (33mmx33mmx150mm) filter unit 7.

Thesethroughholesaremutuallyseparatedbythepartition wall 7b having a thickness of 0.3mm. Each of the through holes 7a is sealed with a plug made of porous sintered ceramics in the shape of a checkered pattern at either ends of its exhaust gas inlet side or an outlet side.

Consequently, it is in the state where the cells C1 and C2 which having openings at either the inlet side or an outlet side of the filter unit 7 were formed. In addition, the oxidizing catalyst which consists of a platinum group element, other metallic elements, its oxide, and the like may be supported to the partition wall 7b of cells C1 and C2. This is because when the oxidization catalyst is supported, the ignition temperature of a particulate is lowered.

Moreover, the filter unit 8 has the same constitution as the filter unit 7 except for cross-sectional form being a right-angled isosceles triangle-like. And in the case of the filterunits 7 and 8 which constitute the filter 3 of this example, average diameter of an pore is 10 μ m, porosity is 43%, the thickness of a cell wall is 0.3mm and the cell pitch is set as 1.8mm.

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STATEMENT OF RELEVANCY

JP 5-302507

The table 1 shows that by setting the length of one side of the square section of a cell 21 from 0.6mm to 0.9mm, then the maximum temperature of the filter can be from 700 °C to 1000 °C. The table 1

Length of one side	Maximum particulate collection amount	Maximum temperature of the filter
0.9	20g (10g/l)	1000°C
0.8	16g (8g/l)	900°C
0.6	10g (5g/l)	700°C

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STATEMENT OF RELEVANCY

JP 2-146212

Table

Equipment No.	1	2	3	4	5
The number of the Cell	36 cell/in ²	64 cell/in ²	100 cell/in ²	100 cell/in ²	200 cell/in ²
Wall thickness t	1.03 mm	0.43 mm	0.30 mm	0.63 mm	0.43 mm
Cell minimum inner diameter w	3.20 mm	2.74 mm	2.24 mm	1.91 mm	1.37 mm
Cell passage Length l	120 mm	(same as the left)	(same as the left)	(same as the left)	(same as the left)
l/w	37.5	43.8	53.6	62.8	87.6
Test result	No problem after 300 hr testing at all	No problem in the level of pressure loss after 300 hr in the testing. Although slight clogging in a part of the cell due to the soot, no problem for the usage.	Collecting ratio dropped to almost 0% during full load driving (exhaust gas temperature at 680 °C) after 50 hr testing, presumably because of the damage by solution thereof.	No problem in the level of pressure loss after 300 hr in the testing although clogging in a part of the cell due to the soot.	The level of pressure loss starts to rise after passage of 120 hr. As a result of the filter body check, some 1/3 of the cell was clogged because of the soot.

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STATEMENT OF RELEVANCY

JP 6-193431

[Example] The following description will explain the present invention specifically by means of examples.

Example 1

Filter was set up in the following way that:
20 sheets of formed body made of silicon carbide with a thickness of 1mm and in the 9cm x 10cm rectangle (porosity:51%, average diameter of an pore:10 μ m), used as a filter board, to which a electrode with a width of 5mm made of palladium was attached as shown in Fig. 3, were installed in the 10cmx10cm square shape pipe at intervals of 1cm.

The surface roughness of formed body made of silicon carbide (measured by JISB0601) was 140 μ m at upstream field and 8 μ m in downstream field in the average of 20 sheets. The filter board was installed such that: opening portion was rotated by 180° for every sheet; and as shown in Fig. 4, the opening was installed in the state where it does not overlap in the direction of current. The lead connected to each electrode through the hole in the exhaust gas duct, was lead to the battery, and the gap of the holes was sealed by insulating material.

This filter was installed in the car which carried the diesel engine of 2000 cc of displacement volume, and the exhaust gas pipe was connected to the diesel engine. Then, the actual run examination for 100 hours was performed. The actual run examination was performed at the rate of about 40 km/H. During the real run examination, while leading an exhaust gas to a filter, 1 kW electric power was supplied for 10 minutes, one by one, for every sheet of a filter board, to heat the filter thus, the regeneration of the filter was carried out intermittently.

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JP 6-193431 cont.

Example 2

Filter was constituted by 20 sheets of formed body similarly to the Example 1 except that MoSi_2 formed body (porosity: 47%, average diameter of an pore: $41 \mu\text{m}$) was used.

20 sheets of formed body made of silicon carbide with a thickness of 1mm and in the 9cm x 10cm rectangle (porosity: 51%, average diameter of an pore: $10 \mu\text{m}$), used as a filter board, to which a electrode with a width of 5mm made of palladium was attached as shown in Fig. 3, were installed in the 10cmx10cm square shape pipe at intervals of 1cm.

The surface roughness of formed body made of MoSi_2 (measured by JISB0601) was $110 \mu\text{m}$ at upstream field and $6 \mu\text{m}$ in downstream field in the average of 20 sheets.

The filter board was installed in the car equipped with the diesel engine similarly to the Example 1.

Then, the actual run examination for 100 hours was performed. The actual run examination was performed at the rate of about 40 km/H. During the real run examination, while leading an exhaust gas to a filter, 1 kW electric power was supplied for 10 minutes, one by one, for every sheet of a filter board, to heat the filter thus, the regeneration of the filter was carried out intermittently.